In re Application of: Ernest GRIMBERG

Serial No.: 10/574,462

Filed: March 31, 2006

Office Action Mailing Date: September 15, 2008

Examiner: Christine SUNG

Group Art Unit: 2884

Attorney Docket: 31363

Amendments to the Drawings:

An attached sheet of drawings, designated as sheet 1/9, includes an amendment to Figure 1 as required by the Examiner. Figure 1 has been labeled "Prior Art".

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REMARKS

Reconsideration of the above-identified application in view of the amendments above and the remarks following is respectfully requested.

Claims 63-85 are in this Application. Claims 63-64, 66-71 and 73-85 have been rejected under 35 U.S.C. §102. Claims 65 and 72 have been rejected under 35 U.S.C. §103. Claims 1-62 have been canceled in a previous response. Claims 70 and 81 have been canceled herewith. Claims 63, 66-68, 71-77 and 82 have been amended herewith.

The Application now comprises, after amendments, claims 63-69, 71-80, and 82-85, of which claims 63 and 77 are in independent form.

Amendments To The Claims

35 U.S.C. §102 Rejections

The Examiner rejected claims 63-64, 66-71 and 73-85 as being anticipated by by Yang et al. (WO Publication No. 01/388825), hereinafter *Yang*. It is submitted in response that amended independent claims 63 and 77 (and claims 64, 66-71, 73-76 and 78-85 dependent thereon) are patentable, in the light of arguments set forth below.

Applicant hereby amends claim 63 to include the limitations of claim 70. Claim 63 now teaches that the IR sensor includes an image processor, which processes the sensor array output signal to form a feedback signal. The feedback signal which controls the adjustment between field of view and pixel grouping that is performed by the sensitivity adjuster. Claim 63 now states:

> 63.   (Currently Amended) An infrared sensor comprising:
> a sensor array comprising multiple IR sensors, configured for collecting IR energy from an external scene;
> a sensitivity adjuster associated with said sensor array, configured for adjusting between a field of view and a grouping of sensing pixels to derive a required image sensitivity, <u>in accordance with a feedback signal</u>; and

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> an image processor, configured for <u>processing a sensor array output signal so as to form said feedback signal</u> for said adjusting.

Corresponding amendments have been made to independent claim 77, by including the limitation of claim 81 in claim 77.

Applicant respectfully traverses the Examiner's rejection of claims 70 and 77. The Examiner states that Yang p. 10 line 23 to p. 11 line 21 teaches that the IR sensor is reconfigurable and is adjusted in real time. Applicant respectfully asserts that *Yang*'s statements re sensor reconfiguration and real-time adjustment <u>do not teach</u> any manner of performing a real-time adjustment of the sensor. Yang merely states the capabilities of sensor reconfiguration and real-time adjustment are available. Therefore the nature of the adjustment, and the mechanism used to perform the adjustment cannot be determined.

Yang p. 10 line 23 to p. 11 line 21 states:

> The re-configurable foveal vision system includes an on-demand foveal vision CMOS imager that allows real-time local resolution adaptation for search and track operation. The CMOS imager has multi-resolution windows or super-pixels that are rectilinear in dimension, where the location of the super-pixel and its depth are user programmable. Super-pixel may be generated by averaging signals from a neighborhood of pixels. Pixel averaging is carried out using column- parallel capacitors. In this scheme, only passive circuits are used to provide a low power implementation.
>
> The re-configurable foveal vision system provides ability to position multiple high-resolution tracking windows anywhere in the FOV to significantly enhance tracking accuracy and speed. The system also provides integration of on-chip timing and control logic to allow quick upload of the programming vectors. Further, a high-speed, low-noise super- pixel generation circuit allows the imager to output the multi- resolution data in real-time. The CMOS imager simultaneously provides both high and low-resolution data from the same region by using multiple ports. This enhances the speed of search and track signal processing.

In the above passage, cited by the Examiner, *Yang* does not discuss using a feedback signal in any manner. There is also no mention of processing or analyzing a sensor output signal for the purpose of either sensor reconfiguration or real-time adjustment. In consequence, the passage above clearly does not disclose processing the sensor output signal for the purpose of forming a feedback signal.

Additionally, *Yang* does not adjust disclose adjusting between the FOV and the pixel grouping in order to obtain a desired sensitivity, as claimed herein. Yang implements sensor windowing, in order to reduce power consumption and to provide different levels of resolution in different portions of the sensor array. Therefore, there is no mutual adjustment However, OPGAL's patent conserves to field of view (total field of view of the camera) and the grouping process changes the INSTANTANEOUS field of view of the new sampling group of pixels used to cover the entire field of view. I hope that I explained the differences in a relative understandable way. The grouping process collects together a number of pixels from 1 (one till 4 by 4 or 5 by 6 or any other numbers). The limit is, the entire image might be selected in one single group in order to obtain maximum signal to noise and minimum resolution. For example, the entire image is divided in 4 groups 2 by 2 for LASER designator tracking or for rockets tracking etc.

Applicant respectfully believes that Examiner's objections regarding lack of novelty are thereby overcome by the present amendments.

It is believed that the dependent claims are allowable as being dependent on an allowable main claim. The specific objections against the dependent claims are therefore not responded to individually.

Claim 75

Applicant respectfully traverses the rejection of claim 75. Applicant draws the Examiner's attention to the difference in the wording of claims 74 and 75. Whereas

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claim 74 relates to switching between "a small readout region and a large readout region", claim 75 relates to switching between "a large pixel grouping and a small pixel grouping". The Examiner states that Yang p. 41 lines 6-14 teach switching between a small readout region and a large readout region. However, the Examiner has not cited any art relating to switching between large and small pixel grouping.

Applicant, therefore, respectfully asserts that the Examiner has made an improper rejection of claim 75.

35 U.S.C. §103 Rejections – Yang in view of Hsieh

Claim 65 has been rejected under 35 U.S.C. §103(a) as being unpatentable over *Yang* in view of Hsieh (NPL – "A New CMOS Circuit Design for the IR FPA..."), hereinafter *Hsieh*. It is submitted that claim 65 is patentable, in light of arguments set forth below.

To establish a prima facie case of obviousness, the prior art references must teach or suggest all the claim limitations. The Examiner states that *Hsieh* teaches a CMOS based IR FPA, and that it would be obvious to a person skilled in the art to have adapted *Yang*'s CMOS detector as an IR FPA. However, *Hsieh* does not disclose processing a sensor array output signal so as to form a feedback signal for adjusting between a sensor's field of view and pixel grouping. Thus neither *Yang* nor *Hsieh*, alone or in combination, teach or suggest all the limitations of claim 65.

35 U.S.C. §103 Rejections – Yang in view of Hsieh

Claim 72 has been rejected under 35 U.S.C. §103(a) as being unpatentable over Yang in view of Park (US Patent No. 4,782,396), hereinafter *Park*. It is submitted that claim 72 is patentable, in light of arguments set forth below.

To establish a prima facie case of obviousness, the prior art references must teach or suggest all the claim limitations. The Examiner states that Park teaches a sensor having an image processor with a contrast detector, and that it would be obvious to a person skilled in the art to have included *Park*'s contrast detector with the

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invention disclosed by *Yang*. However, *Park* does not disclose processing a sensor array output signal so as to form a feedback signal for adjusting between a sensor's field of view and pixel grouping. Thus neither *Yang* nor *Park*, alone or in combination, teach or suggest all the limitations of claim 72.

Amendments To The Drawings

An amended FIG. 1 labeled as "Prior Art" is filed herewith.

In view of the above amendments and remarks, it is respectfully submitted that claims 63-69, 71-80 and 82-85 are now in condition for allowance. A prompt notice of allowance is respectfully and earnestly solicited.
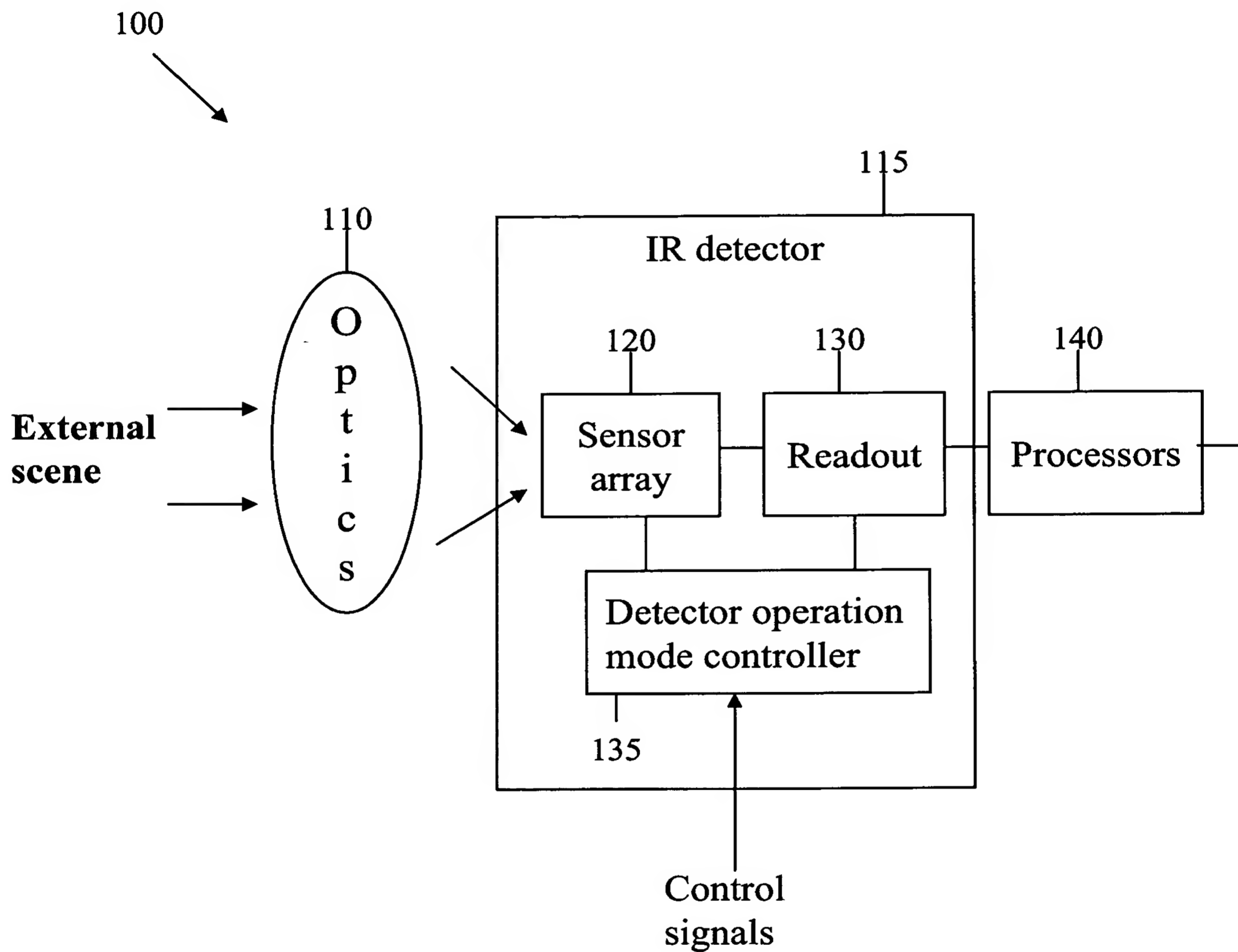
Respectfully submitted,

Martin D. Moynihan
Registration No. 40,338

Date: January 6, 2009

Enclosures:

- Petition for Extension of Time (One Month);
- Letter to Chief Draftsman;
- 1 Sheet of Annotated Marked-Up Drawing;
- Formal Drawing Transmittal Sheet; and
- Complete Set of Replacement Drawing Sheets.

100

115

110

IR detector

120 130 140

O
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**External
scene**

Sensor
array

Readout

Processors

Detector operation
mode controller

135

Control
signals

Figure 1 (Prior Art)